Description of Scenario 1C, Non-forested Vegetation Types - Resiliency, Vulnerability, and Departure from Desired Conditions

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To be as consistent as possible with the forested vegetation scenario, this scenario compares non-forested vegetation type Desired Conditions (DC) to current conditions to represent factors that contribute to ecosystem function, resiliency and vulnerability to disturbance agents likely to limit these communities from moving toward and achieving those desired conditions. These DCs and the departure from the DCs represent our current view of non-forested vegetation resiliency, or lack thereof in some cases, under current climatic conditions. Adaptation strategies will need to be assessed, and DCs may need to be modified as we learn more about the influence of climate change on these communities and the various processes that affect their composition, structure, resiliency and landscape pattern.

Since there are no readily available FIA data describing non-forested vegetation types, we used NatureServe's Ecological Systems to describe current conditions.

NatureServe defines them as follows:

> **"Ecological systems represent recurring groups of biological communities that are found in similar physical environments and are influenced by similar dynamic ecological processes, such as fire or flooding.** They are intended to provide a classification unit that is readily **mappable,** often from remote imagery, and readily identifiable by conservation and resource managers in the field.

> Terrestrial ecological systems are specifically defined as a group of plant community types (associations) that tend to co-occur within landscapes with similar ecological processes, substrates, and/or environmental gradients. A given system will typically manifest itself in a landscape at intermediate geographic scales of tens to thousands of hectares and will persist for 50 or more years. This temporal scale allows typical successional dynamics to be integrated into the concept of each unit. With these temporal and spatial scales bounding the concept of ecological systems, we then integrate multiple ecological factors—or *diagnostic classifiers*—to define each classification unit. The multiple ecological factors are evaluated and combined in different ways to explain the spatial co-occurrence of plant associations."

The approach used for forested vegetation was applied to non-forested vegetation, with modifications. The focus was on intact, functional vegetation types that had most native species present in adequate amounts. Invasive weeds were strongly considered in terms of their presence and amount (relative to the native species). Other factors considered were fire exclusion and resulting conifer re-establishment, and grazing (both domestic and native ungulates). In addition, the non-forested vegetation types for terrestrial species were described using ecological systems. They were assessed based upon wildlife habitat criteria and as such, the ratings may differ from those in this scenario.

Originally feasibility was considered during the ratings, as shown below.

Scenario 1c: *Ecosystem Resilience and Vulnerability in non-forested areas*

(70)   Value   Composition of non-forest types with noxious weed hazard**

(20)   Risks   Departure from historic fire regime of non-forest types (10%)**

                      Grazing (10%)**

(10)   Feasibility   FS ownership

* Suggested weights in parentheses

** NetWeaver model in place

However, it was determined that we could drop feasibility and just use value and risk. In addition, risk was further refined to show the proportion of each impact. The Dakota Prairie sub-region is not shown since the Dry Grass Ecological System is not represented in this sub-region.

Sub-Region: W. MT

Vegetation Type: Dry Grass

Value: 60 %

This type is somewhat rare in W MT. It's declining and/or is highly susceptible to invasives, then conifer encroachment due to fire exclusion, and then grazing.

Risk: 40%

   Invasives: 20

   Fire Exclusion: 12

Grazing/Herbivory: 8

Sub-Region: E. MT

Vegetation Type: Dry Grass

Value: 50 %

This type is more common east of the divide. It is highly susceptible to invasives, then conifer encroachment.

Risk: 50%

Invasives: 25

Fire Exclusion: 10

Grazing/Herbivory: 15

Sub-Region: N ID

Vegetation Type: Dry Grass

Value: 50 %

This is a rare type in N ID. It has been converted to agriculture or highly altered by grazing and invasives, combined.

Risk: 50%

Invasives: 30

Fire Exclusion: 5

Grazing/Herbivory: 15

A table showing the value and risk of each non-forested vegetation type by sub-region was then used in the EMDS model.

EVG	N.ID V/R*	W. MT V/R	E.MT V/R	DPG V/R
Dry Grass	40/60	40/60	40/60	na
Moist Grass	60/40	60/40	60/40	na
Mixed Grass Prairie	na	na	50/50	50/50
Tall grass Prairie	na	na	na	60/40
Sagebrush/Xeric Shrub	60/40	60/40	50/50	50/50
Mixed High Elevation Shrub	70/30	70/30	70/30	na
Deciduous Shrub	50/50	60/40	70/30	60/40
Alpine	80/20	80/20	80/20	na
Riparian/Wetland	70/30	70/30	70/30	70/30
Woody Draw	50/50	60/40	60/40	60/40

| Exotic | 10/90 | 10/90 | 10/90 | 10/90 |
| Early Seral Herb | 20/80 | 20/80 | 20/80 | 20/80 |

* V= Value, R= Risk